MOSIACS in Science at Mammoth Cave National Park (MCNP)

Sponsored by the National Park Service in partnership with the Geological Society of America

By: Jay Kim

Role as a Karst Geoscience Research Assistant

- Worked at park's Division of Science and Resource Management (SRM)
- Assisted park's GIS Specialist (Lillian Scoggins) in updating park's lesser caves inventory.
- Assisted other SRM staff and visiting scientists with park biology, ecology, geology projects.

Park Background and Location

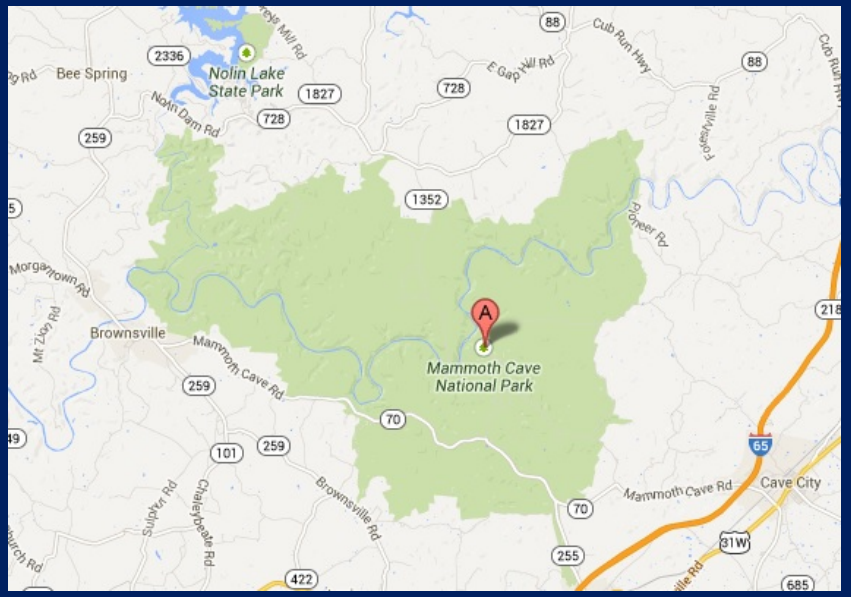
•Governed by the National Park Service

•Est. July 1st 1941 as a national park, World Heritage Site in 1981, Biosphere Reserve in 1990

•Located in central Kentucky, park is centered around the Green River

•52,830 acres of river cut karst valleys covered in forest overlaying the world's longest cave system

•As of today, 400 miles of surveyed passageways by the Cave Research Foundation

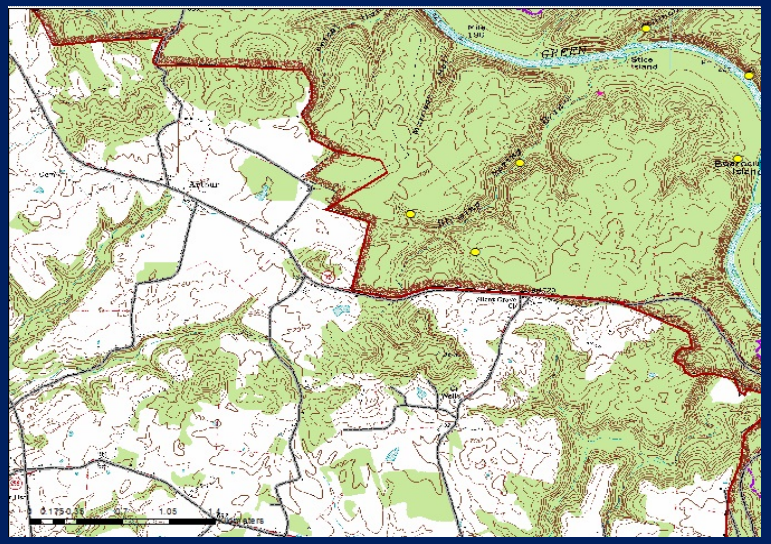


Lesser Caves Inventory

- Park contains over 400 main and lesser caves.
- Most caves have been GPS marked and inventoried in park's GIS database.
- Most caves have been physically marked with survey marker, but not all.
- Tasked to survey and install physical survey markers.

Lesser Caves Inventory

- 1.) Consult park's lesser caves GIS database to find GPS cave GPS coordinates
- 2.) Hike through backcountry to cave with compass and GPS unit.
- 3.) Check to see if cave exists
- 4.) Take notes on flora, fauna, hydrology, depth, geology, etc.
- 5.) Check to see if cave needs a brass cap or aluminum stake survey marker.



Lesser Caves Inventory

Caves of Mammoth Cave National Park — Change Log

"A World Heritage Site"

UTM

	NAME	Example Cave	CAVE #	4XX	ENT#		SYS?
	AREA				COUNTY		
	QUAD	Mammoth Cave 7.5	QUAD.INDIC.				
NAD27	UTM27E	55555	UTM27N	55555	ZONE		
NAD83	UTM83E	55555	UTM83N	55555			
	NORTH LAT.		WEST LONG.		OBTAINED?		
	Lat/Long	° ' " N	° ' " W				
	CAVE NORTH		CAVE EAST		(CRF CAVE GRID)		
	GPS UNIT				GPS DATE		
	GPS Comments						
	ENT. WIDTH	3	ENT. HEIGHT	0	ENT. DEPTH	7	ENT. ELEV. (Use feet)
	FIELD INDIC.						
	DIRECTIONS TO ENTRANCE	Take road to side of hill, hike NW for 500 m until you reach cave					

Info sheet for cave

Measuring cave depth

Lesser Caves Inventory

- 6.) Conduct second trip to cave to install cave survey marker.

OR

Other Projects:
Cave Biology Inventory Counts

- Assisted visiting scientist Dr. Kathleen Lavoie from SUNY Plattsburgh conduct cave biology inventory counts to assess the health of individual cave ecologies.
- Common cave species we counted were *Rhaphidophoridae* cave crickets, *Heliozymid* cave flies, *Meta Menardi* cave spiders, and *Neaphaenops tellkampfii* cave beetles.

Other Projects:
Cave Biology Inventory Counts

Rhaphidophoridae cave crickets

Source: http://en.wikipedia.org/wiki/File:Ceuthophiluscricket.jpg

Heliozymid cave flies

Source: http://www.diptera.info/photogallery.php?photo_id=7312

Meta Menardi cave spiders

Source: http://en.wikipedia.org/wiki/File:Meta_menardi.jpg

Neaphaenops tellkampfii cave beetles

Source: http://bugguide.net/node/view/90550

Other Projects:
Cave Biology Inventory Counts

Climbing into cave to conduct cave biology counts

Conducting cave biology counts.

Other Projects:
MCNP Fire Management Plan (FMP)2013 update

Source: http://www.nps.gov/maca/parkmgmt/firemanagement.htm

- Attended meetings with SRM staff to discuss how the update should be written
- Helped compile edits made to FMP update rough drafts
- Used ArcGIS 10 to draw in proposed fire management units in park.

Other Projects:
Backcountry Trail Monitoring

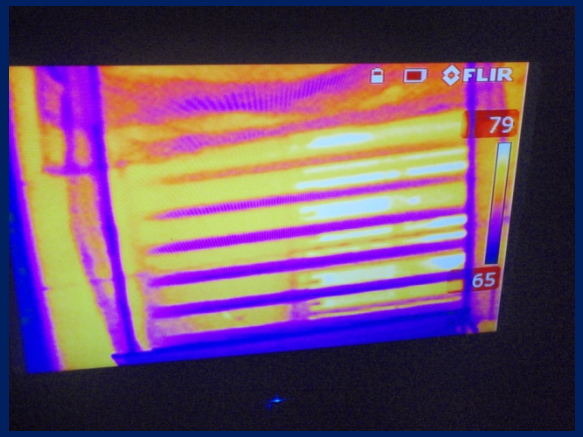
Modified from: http://www.nps.gov/maca/planyourvisit/loader.cfm?csModule=security/getfile&PageID=107668

- Helped SCA interns assess amount of soil erosion that on MCNP backcountry trails.
- Which leads to the next project…

Other Projects:
Freshwater Stream Benthic Macroinvertebrate (BMI) Surveys

- Benthic Macroinvertebrates: Small invertebrates that are large enough to be seen without a microscope, lives at the bottom of streambeds.
- Conducted on streams that run near, adjacent to, or intersect MCNP backcountry trails with known erosion.
- BMI surveyed to determine if soil erosion runoff from backcountry trails are having a negative effect on nearby freshwater stream ecology.

Other Projects:
MCNP Bat Research



- Helped bat interns from Northwestern with evening bat counts at known bat roosts.
- Utilized IR camera or night vision goggles.
- At the Wandering Woods bat roost, caught bats to have their health assessed, inventoried, and radio tagged.